CLAIMS:

1. An upconversion light source comprising:

a silicate glass comprising silica and oxides of Al, La, and Tm; and

a pump source of a first radiation having a first peak wavelength coupled to the silicate glass;

wherein the first radiation excites Tm ions in the silicate glass to emit at second radiation having a second peak wavelength shorter than the first peak wavelength.

2. The light source of claim 1, wherein the silicate glass further comprises an oxide of Ge.

3. The light source of claim 1, wherein the silicate glass further comprises an oxide of Er.

4. The light source of claim 1, wherein the silicate glass further comprises oxides of Ge and Er.

5. The light source of claim 4, wherein:

a concentration of Al is about 0.5 mol% to about 20 mol%;

a concentration of La is greater than 0 mol% to about 4 mol%;

a concentration of Ge is from 0 mol% to about 15 mol%;

a concentration of Er is from 0 ppm to about 3,000 ppm; and

a concentration of Tm is about 15 ppm to about 10,000 ppm.

6. The light source of claim 1, wherein the silicate glass is a portion of an optical fiber.

7. The light source of claim 1, wherein the first peak wavelength is between about 1000 nm and about 1200 nm.

8. The light source of claim 1, wherein the first peak wavelength is about 1060 nm and the second peak wavelength is between about 450 nm and about 480 nm.

9. The light source of claim 1, wherein the first peak wavelength is about 1060 nm and the second peak wavelength is between about 360 nm and about 370 nm.

10. A curing radiation source including the light source of claim 1.

11. A display device including the light source of claim 1.

12. A method for upconverting first radiation having a first peak wavelength into second radiation having a second peak wavelength that is shorter than the first peak wavelength, the method comprising:

providing a silicate glass comprising silica and oxides of Al, La, and Tm; and

irradiating the silicate glass with the first radiation causing the silicate glass to emit the second radiation.

13. The method of claim 12, wherein the silicate glass further includes GeO_2.

14. The method of claim 12, wherein the silicate glass further includes Er_2O_3.

15. The method of claim 12, wherein the silicate glass further includes oxides of Ge and Er.

16. A light-emitting fiber comprising:

an optical glass fiber comprising silica and oxides of Al, La, Ge, Er, and Tm; and

a pump source of a first radiation having a first peak wavelength coupled to the optical fiber to excite Tm ions in the core of the optical glass fiber so that the fiber emits a second radiation having a second peak wavelength, that is shorter than the first peak wavelength.

17. The light-emitting fiber of claim 16, wherein the first peak wavelength is about 1060 nm.

18. An upconversion light source comprising:

a silicate glass comprising silica and oxides of Al, La, and Tm; and

a pump source of pump radiation for exciting Tm ions in the silicate glass to $^1G_4$ and $^1D_2$ excited states to produce upconverted emitted radiation.

19. The light source of claim 18, wherein the silicate glass further comprises an oxide of Ge.

20. The light source of claim 18, wherein the silicate glass further comprises an oxide of Er.

21. The light source of claim 18, wherein the silicate glass further comprises oxides of Ge and Er.

22. The light source of claim 21, wherein the silicate glass includes:

a concentration of A1 of about 0.5 mol% to about 20 mol%;

a concentration of La of greater than 0 mol% to about 4 mol%;

a concentration of Ge of from 0 mol% to about 15 mol%;

a concentration of Er of from 0 ppm to about 3,000 ppm; and

a concentration of Tm of about 15 ppm to about 10,000 ppm.

23. The light source of claim 18, wherein the silicate glass is a portion of an optical fiber.

24. The light source of claim 18, wherein the pump radiation has a peak wavelength of between about 1000 nm to about 1200 nm.

25. The light source of claim 18, wherein the pump radiation has a peak wavelength of about 1060 nm and the upconverted emitted radiation has a peak wavelength between about 450 and about 480 nm.

26. The light source of claim 18, wherein the pump radiation has a peak wavelength of about 1060 nm and the upconverted emitted radiation has a peak wavelength between about 360 nm and about 370 nm.

27. A method producing blue light, the method comprising:

providing a silicate glass comprising silica and oxides of Al, La, and Tm; and

irradiating the silicate glass with pump radiation of a wavelength which is absorbed by Tm ions in the silicate glass to cause the Tm ions in the silicate glass to emit blue light.

28. The method of claim 27, wherein the silicate glass further includes GeO_2.

29. The method of claim 28, wherein the silicate glass further includes Er_2O_3.